Claims

[c1] 1. A seamless flexible electrostatographic imaging member belt fabrication method comprising:
providing a flexible substrate support sheet;
placing a first pattern template on a first portion of the support sheet;
producing first desired features on the first portion of the substrate support sheet, including removing material from the substrate support sheet with first emissions, the first pattern template preventing the first emissions from striking the support sheet and thus preventing removal of material from under the first pattern template;
placing a second pattern template on a second portion of the support sheet, the second pattern template being complementary to the first pattern template;
producing second desired features on the second portion of the substrate support sheet complementary to the first desired features, including removing material from the substrate support sheet with second emissions, the second pattern template preventing the second emissions from striking the support sheet and thus preventing removal of material from under the second pattern template;
overlapping the first and second desired features;
bonding the first desired pattern with the second desired pattern to produce a seamed belt having substantially no added seam thickness; and
applying at least one coating over the seamed belt.

[c2] 2. The method of claim 1 wherein removing material from the substrate support sheet with emissions includes inducing a desired shape in at least one of the first and second emissions by passing the at least one of the first and second emissions through at least one mask.

[c3] 3. The method of claim 1 wherein at least one of the first and second emissions comprises electromagnetic radiation.

[c4] 4. The method of claim 1 wherein at least one of the first and second emissions comprises a particle beam.

[c5] 5. The method of claim 1 wherein removing material from the substrate support

sheet with at least one of the first emissions and second emissions further comprises inducing relative motion between the at least one of the first emissions and second emissions and the substrate support sheet.

[c6] 6. The method of claim 1 further comprising coating the seamed belt with a photoconductive material.

[c7] 7. The method of claim 1 wherein bonding comprises ultrasonically welding.

[c8] 8. The method of claim 1 wherein bonding comprises applying and curing an adhesive.

9. The method of claim 1 wherein the first and second templates are shaped to form a puzzle-cut pattern on the substrate support sheet.

[c9] 10. A seamless flexible electrostatographic imaging member belt fabrication method comprising:

providing a flexible substrate support sheet;

placing a first pattern template on a first portion of the support sheet;

illuminating a first part of the substrate support sheet with a laser beam to produce first desired features on the substrate support sheet, including removing material from the substrate support sheet with first emissions, the first pattern template preventing the first emissions from striking the support sheet and thus preventing removal of material from under the first pattern template;

placing a second pattern template on a second portion of the substrate support sheet, the second pattern template being complementary to the first pattern template;

illuminating a second part of the substrate support sheet with a laser beam to produce second desired features on the substrate support sheet, including removing material from the substrate support sheet with second emissions, the second pattern template preventing the second emissions from striking the support sheet and thus preventing removal of material from under the second pattern template;

overlapping the first and second desired features;

bonding the first desired pattern with the second desired pattern to produce a

seamed belt having substantially no added seam thickness; and

applying at least one coating over the seamed belt.

[c10] 11. The method of fabricating a seamed flexible belt according to claim 10 wherein the illuminating a first part of the flexible substrate support sheet with a laser beam to produce first desired features on the substrate support sheet includes:

generating a laser beam;

spreading the laser beam;

illuminating at least one pattered mask such that parts of the spread laser beam pass through the mask as machining light; and

directing the machining light onto the first portion of the substrate support sheet and the first pattern template.

[c11] 12. The method of fabricating a seamed flexible belt according to claim 10 wherein the first pattern template and the second pattern template induce complementary puzzle cut patterns in the respective first and second portions, and wherein the overlapping and bonding includes mating the puzzle-cut seams and subjecting the overlapped portions to ultrasonic welding.

13. The method of claim 10 wherein bonding includes applying and curing an adhesive.

[c12] 14. The method of fabricating a seamed belt according to claim 12 wherein the first and second patterns form a rabbeted joint.

[c13] 15. The method of fabricating a seamed belt according to claim 12 wherein the first and second patterns form a rabbeted joint.

[c14] 16. A seamless flexible electrostatographic imaging member belt fabrication method comprising:

providing a flexible substrate support sheet;

placing first and second complementary pattern templates over first and second portions of the substrate support sheet;

bombarding the first portion of the substrate support sheet with first emissions to produce first desired features in a first pattern;

bombarding the second portion of the substrate support sheet with second emissions to produce second desired features in a second pattern complementary to the first pattern;
mating the first and second desired features;
bonding the first desired features with the second desired features to produce a substantially seamless belt; and
applying at least one coating to the belt.

[c15] 17. The method of claim 15 wherein bombarding a second portion includes bombarding an opposite surface of an opposite end of the substrate support sheet.

[c16] 18. The method of claim 16 wherein applying at least one coating includes applying a photoconductive coating.

[c17] 19. The method of claim 16 wherein providing a substrate support sheet comprises providing a single layer of substantially homogeneous material.

[c18] 20. The method of claim 18 wherein providing a flexible substrate sheet further comprises providing a sheet of PET.

[c19] 21. A seamless flexible electrostatographic imaging member belt fabrication method comprising:
providing a flexible substrate support sheet;
placing first and second pattern templates on respective first and second portions of the substrate support sheet;
producing first desired features on the first portion of the substrate support sheet, including removing material from the substrate support sheet with first emissions;
producing second desired features on the second portion of the substrate support sheet complementary to the first desired features, including removing material from the substrate support sheet with second emissions;
removing material from the substrate support sheet with first and second emissions including inducing a desired shape in at least one of the first and second emissions by passing the at least one of the first and second emissions

through at least one mask;
removing material from the substrate with first emissions further including inducing relative motion between the laser beam and the substrate support sheet;
overlapping the first and second desired features;
bonding the first desired features with the second desired features to produce a substantially seamless belt; and
applying at least one coating the substrate support sheet, the at least one coating including a photoconductive coating.

[c20] 22. The method of claim 20 wherein bonding comprises ultrasonically welding.

[c21] 23. The method of claim 20 wherein bonding comprises applying and curing an adhesive.